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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,498	08/14/2006	Michael Inbasekaran	Q92640	3430

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EXAMINER	
YANG, JAY	

ART UNIT	PAPER NUMBER
1794	

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08/05/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/579,498	INBASEKARAN ET AL.	
	Examiner	Art Unit	
	JACK YANG	4132	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *08 August 2006, 16 May 2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections – 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

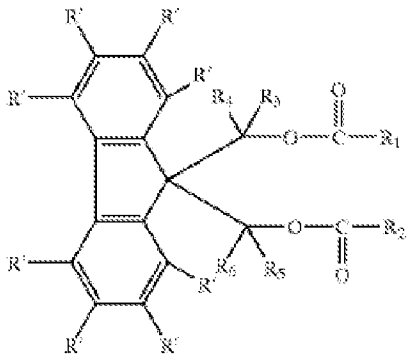
> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-12 are rejected as being unpatentable over Gao et al. (US 2005/0239636 A1) in view of Ishizawa et al. (US 7,012,123 B2).

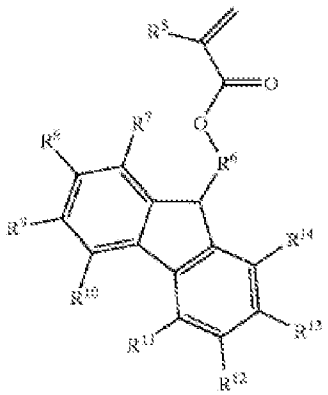
Regarding Claims 1-9, Gao et al. discloses the following compound **1:**



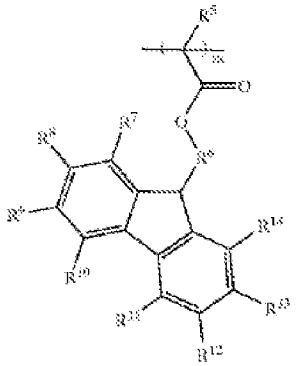
((III), page 8) where R' = hydrogen ([0392]), R_1 = R_2 = vinyl ([0029]), and R_3-R_5 =

hydrogen ([0022]). However, Gao et al. does not disclose amino substituents on the fluorenyl skeleton.

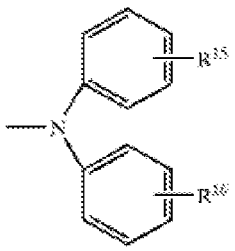
Ishizawa et al. discloses the following compound **2** suitable for use as a charge-transporting material:



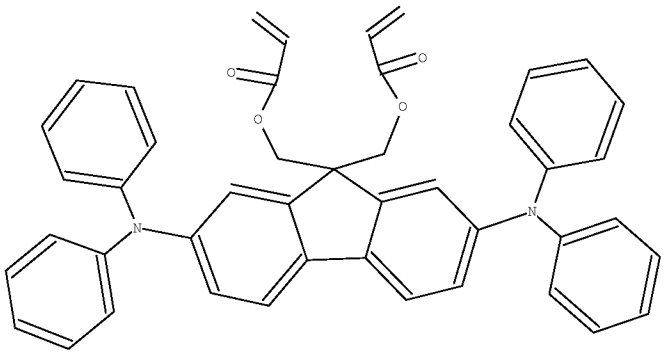
((4), col. 5, line 55) that can be polymerized to produce **3:**



((2), col. 3, line 45) with R^5 = hydrogen (col. 3, line 55), R^6 = methyl (col. 4, line 53) or none (col. 3, line 56), R^8 = R^{13} =



((3), col. 4, line 10), $R^{15} = R^{16}$ = hydrogen (col. 4, lines 16-17), and $R^7 = R^9 = R^{10} = R^{11} = R^{12} = R^{14}$ = hydrogen (col. 4 lines 2-3) such that according to formula (I), a = b = 0, $Ar^1 = Ar^2 = Ar^3 = Ar^4 = C_{6-20}$ aromatic group (phenyl), R^2 = hydrogen, and R^1 = a C_{1-40} hydrocarbyl group wherein one or more carbons are substituted by one or more heteroatoms selected from S, N, O, P, B, or Si atoms (if R_6 of compound (3) is none, $R_1 = -(R^5)_m\text{-}OC(O)(R^5)_mCR^4{=}CR_4{}^2$ with m = 0, R_4 = hydrogen, else if R_6 of compound (3) = methyl then R_1 = methyl acrylate, which has a double bond). It would have been obvious to one of ordinary skill in the art at the time of the invention to substitute biphenyl amino groups as disclosed by Ishizawa et al. for two of the hydrogens of **1** to result in the following compound **4:**



The motivation for such a substitution would be that due to the structural similarity between **1** and **2** with the previously assigned substitutions, the former compound should display similar physical/chemical properties as the latter to act as charge-transporting material (in addition to the fact that fluorenyl groups can generally act as hole-transporting material). Substitution of the biphenyl amino groups for the hydrogens would enhance its hole-transporting properties for use in an organic EL element.

Regarding Claim 9, it would have been obvious to one of ordinary skill in the art at the time of the invention to subject **4** to the same polymerization conditions as **2** as disclosed by Ishizawa et al. (col. 8, line 60 – col. 9, line 13), which would result in a polymer represented by formula (Ia). The motivation would be that the polymerization of the monomers would lead to material with good heat resistance and film-forming properties compared to low-molecular materials (col. 1, lines 29-38).

Regarding Claim 11, Ishizawa et al. discloses a process for preparing polymers by anionic polymerization that involves heating a mixture from possibly -80° C to 10° C containing monomers such as **2** after addition of initiator (col. 7, lines 6-14). It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the same process to **4**. The motivation would be that **4** also contains vinyl groups that is susceptible to polymerization.

Regarding Claims 10 and 12, Ishizawa et al. discloses a composition comprising 2,4,7-trinitrofluorene malonitrile (as a dopant) and **3** in dichloromethane to produce a thin film (col. 11, lines 44-50). It would have been obvious to one of ordinary skill in the art at the time of the invention to substitute the polymerized version of **4** for **3** to produce the thin film composition according to Claim 9. The motivation would be to form a thin film of high charge transporting ability as a result of the formation of a charge transfer complex (col. 7, lines 29-34).

4. Claims 13 and 14, are rejected under 35 U.S.C. 103(a) as being unpatentable over unpatentable over Gao et al. (US 2005/0239636 A1) in view of Ishizawa et al. (US 7,012,123 B2) and Kikuchi et al. (US 5,378,510 A).

Gao et al. in view of Ishizawa discloses the film according to Claim 12 as shown above. However, it does not disclose an electronic device nor an EL device comprising one or more layers of polymer films, at least one of which comprises a film according to Claim 12.

Kikuchi et al. discloses an organic EL device with a hole-transporting layer (3a, Fig. 2) that comprises a hole-transporting compound (col. 61, lines 14-16) in addition to pair of electrodes (2 and 4). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the film composition according to Claim 12 as disclosed by Gao et al. in view of Ishizawa et al. The motivation would be that the film composition would have high charge-transporting properties to allow efficient hole injection into the light-emitting layer, thereby improving device performance.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JACK YANG whose telephone number is (571)270-1137. The examiner can normally be reached on Monday to Thursday from 8:30 am to 6:00 pm Eastern.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike LaVilla can be reached on 571-272-1539. The fax

phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. Y./
Examiner, Art Unit 4132

/Milton I. Cano/
Supervisory Patent Examiner, Art Unit 4132